Space Weather Forecast

Issued on Tuesday, 02 July 2024 at 01:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Chance of G1/G2 Minor/Moderate storm intervals days 2-3 (02-03 Jul), and again on day 4 (05 Jul) due to Coronal Mass Ejection (CME) influences.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate, with an impulsive low-level Moderate-class flare observed from the southwest at 01/1102UTC. There are currently thirteen regions on the disc, most of which are small and simple. Two moderately long spots are apparent in the eastern hemisphere, with slight development of intermediate spots, with a tenuous delta spot emerging within a complex sunspot region located in the southeast quadrant. There is a small spot in the southwest which is responsible for the aforementioned flare, this spot exhibits a north-south aligned magnetic orientation.

A large filament (arc of plasma) in the southwest was observed lifting off from the Sun's surface around 29/1530UTC, with a subsequent Coronal Mass Ejection (CME) was observed in coronagraph imagery. Analysis suggests this could give a glancing blow at Earth on days 1 or 2 (02-03 Jul).

A further CME was observed following the aforementioned Moderate-class flare from a sunspot region in the southwest quadrant, which has been analysed and results suggest a possible glancing blow on day 4 (05 Jul).

No other Earth-directed have been observed in imagery during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds are still showing weak coronal mass ejection effects after the arrival on 28 Jun. Wind speeds have been elevated to slightly elevated. The Interplanetary Magnetic Field was weak and on a declining trend. The north-south component varied weakly. Geomagnetic activity was Quiet (Kp1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely to continue, with a chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: Effects from the CME that arrived at Earth on 28 Jun continue to wane. A CME from a large filament lift-off on 29 Jun may give a glancing blow either on day 1 or day 2 (02-03 Jul). A second CME, which left the Sun on the 01 Jul, following the Moderate-class flare from a sunspot located in the southwest quadrant, has been analysed and results suggest a possible glancing blow on day 4 (05 Jul). Otherwise, there are no significant coronal holes on the disc to give any fast wind influence.

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Met Office Space Weather Forecast

Geomagnetic activity is expected to be generally Quiet to Unsettled (Kp1-3), with Active (Kp4) intervals and a chance of G1/Minor to G2/Moderate storms (Kp5-6) on either day 1 (02 Jul) or day 2 (03 Jul) under CME influence, however confidence is fairly low. Returning to mostly Quiet to Unsettled conditions on day 3 (04 Jul). A further enhancement is possible on day 4 (05 Jul) due to another potential glancing blow from the CME which left the Sun on 01 Jul, with a slight chance of G1-G2/Minor-Moderate Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, but with a very slight chance of exceeding the S1/Minor Storm threshold should any notable flares occur from the numerous sunspots that currently occupy the visible disc.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	30	5	30
Strong	G3	No	10	5	1	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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